

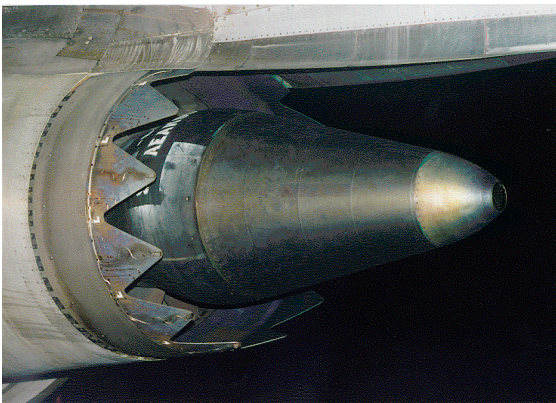
## General Electric Aircraft Engines

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GEAE has made considerable progress in the past year in developing the chevron nozzle concept for application to GE/CFMI engines. Over 50 chevron nozzle designs have been tested in GE's Cell 41 Anechoic Free Jet Scale Model Test Facility, to characterize and screen various design parameter effects on jet mixing noise for CF6, CFM56 and CF34 engine models. Results obtained thus far have been very positive, with jet noise reduction benefits of as much as 3.5 EPNdB demonstrated on a component basis, yielding a net engine system benefit of ~2.5 EPNdB at takeoff certification conditions. Wind tunnel performance testing of these chevron nozzles has demonstrated a minimal performance impact.

GEAE has conducted full-scale engine validation of the designs developed through scale model testing in Cell 41. Engine test results confirmed the measured scale model test acoustic benefits and performance impact, and were essential in verifying mechanical integrity in a real engine environment. Figure 1 below shows the full-scale engine test nozzles tested for two engine models. This work is a good example of successfully taking NASA AST Program Noise Reduction technology previously demonstrated as a concept in model scale, transitioning it to full scale engine design, and successfully demonstrating the concept benefits. This required addressing many difficult technical issues unique to engine application, in order to make the simple model concept demonstration become a reality on an engine system.

### Static Engine Tests of Chevron Nozzles



CF6-80C2



CF34-8C

***Acoustic Benefit from Engine Static Test Confirmed  
Noise Reduction Measured in Scale Model Tests***